

Amendments to the Specification:

Please replace paragraph [012] with the following paragraph:

[012] FIG. 1 illustrates an exemplary sectional view of a viscometer 10. Generally, the viscometer 10 includes a fluid flow channel 12, a heating element 14 disposed around at least an exterior portion of a fluid flow channel 12 near an inlet end 22, and a temperature sensor 16 positioned within the fluid flow channel 12 downstream of the heating element 14. The viscometer 10 operates on the convection principle that a fluid will rise in a direction opposite from a force of gravity when heated. Based on this principle, the inventors have innovatively created a very accurate, yet simple, inexpensive viscometer that may use a single temperature sensor 16 and does not ~~rely~~ rely on any moving parts. The flow channel 12 receives a fluid 20, such as oil, at an inlet end 22 and discharges the fluid 20 at an outlet end 24. In an aspect of the invention, the flow channel 12 may be tubular. In addition, the flow channel 12 may be formed from two different materials. For example, an upstream portion 19 of the flow channel 12, such as a portion surrounded by the heating element 14 may be formed from a relatively high thermally conductive material, such as copper or aluminum. A downstream portion 17 of the flow channel 12, such as a portion housing the temperature sensor 16, may be formed from a relatively low thermally conductive material. In a further aspect of the invention, a diameter, D, of the flow channel 12 may range between 2 millimeters (0.08 inches) and 3.5 millimeters (0.14 inches), for measuring fluids having a viscosity in the range of 10 millimeters²/second to 60 millimeters²/second. In yet another aspect, the flow channel 12 may have a constant inner diameter.

Please replace paragraph [013] with the following paragraph:

[013] The heating element 14 heats a portion of the fluid 20 near the inlet end 22, causing the fluid 20 to flow in the flow guide 12 by convection. In one form, the heating element 14 may include heating wires wrapped around an exterior portion of the flow

channel 12 near the inlet end 22. In another form, the flow guide 12 may include a ceramic tube with a heating element 14, for example, painted around a portion of the exterior of the ceramic tube near the inlet end 22. An aspect of the present invention that is particularly advantageous is the fact that the heating element 14 is arranged not to interfere with the fluid 20 flow that passes through the flow channel 12. This avoids or reduces the possibility of turbulence formation in the fluid 20 passing through the flow channel 12. Turbulence in the fluid 20 is not desirable since this could affect the accuracy of the viscometer 10. According to the convection principle, a lower viscosity fluid will flow away from the heating element 14 at a faster rate than a higher viscosity fluid, as the fluids are heated by the same amount. Accordingly, by monitoring temperature change of the fluid 20 over time, viscosity of the fluid 20 can be determined. To monitor the temperature of the fluid 20, the temperature sensor 16 is positioned within the fluid flow channel 12 downstream of the heating element 14 at a distance L, such as from 3 millimeters (0.12 inches) to 10 millimeters (0.4 inches), for measuring a temperature of the fluid 20 as it passes by the sensor 16. In an aspect of the invention, the temperature sensor 16 may be made as small as practical to prevent turbulence in the flow channel 12 near the sensor 16, which might affect a temperature measurement. For example, the temperature sensor 16 may be a resistive temperature device (RTD) having a length of approximately 2 millimeters (0.08 inches), and a width and depth of approximately 0.5 millimeters (0.02 inches), and having a low thermal mass, or a relatively fast temperature response time such as 0.1 second. By measuring the temperature of the fluid flowing through the fluid flow channel 12 over time, the viscosity of the fluid 20 can be determined by comparing recorded temperature change characteristics to temperature change characteristic for know-known fluid viscosities as may be stored in a database.